

WHAT IS CLAIMED IS:

1. A variable gain circuit comprising:
- a variable gain amplifier which receives an input signal, outputs an amplified signal, and includes a first field-effect transistor;
- a gain control signal compensation circuit which outputs a gain control signal for controlling a gain of said variable gain amplifier and includes a second field-effect transistor; and
- a gain deviation correction circuit which corrects a gain deviation based on said variable gain amplifier and said gain control signal compensation circuit.
2. The circuit according to claim 1, wherein said first variable gain amplifier comprises multi-stage amplifiers.
3. The circuit according to claim 1, which further comprises a gain control signal converter which converts an external gain control signal into an internal gain control signal, said variable gain amplifier including the first field-effect transistor is a first variable gain amplifier, the first gain control signal is a first gain control signal, said gain control signal compensation circuit including the second field-effect transistor is a first gain control signal compensation circuit, said gain deviation correction circuit includes a second gain control signal compensation circuit and a second variable gain

amplifier, and said first gain control signal
compensation circuit converts the internal gain control
signal into the first gain control signal and inputs
the first gain control signal to said first variable
gain amplifier to control gain of said first variable
gain amplifier, and said second gain control signal
compensation circuit converts the internal gain control
signal into the second gain control signal and inputs
the second gain control signal to said second variable
gain amplifier to control gain of said second variable
gain amplifier.

2 ¹/₁. The circuit according to claim ¹/₁, wherein said
first variable gain amplifier comprises multi-stage
amplifiers.

3 ¹/₂. The circuit according to claim ¹/₂, wherein said
second gain control signal compensation circuit
comprises a circuit obtained by cascading a first gain
control signal compensation circuit unit having a
structure equivalent to that of said first gain control
signal compensation circuit, a voltage/current
converter unit, and a second gain control signal
compensation circuit unit having an arrangement
equivalent to that of said first gain control signal
compensation circuit.

4 ³/₄. The circuit according to claim ³/₄, wherein said
first variable gain amplifier comprises multi-stage
amplifiers.

5 1. The circuit according to claim ³8, wherein said voltage/current converter unit converts the first gain control signal V_{z1} into a current signal I_{z1} according to $I_{z1} = f(V_{z1})$, where I_{z1} is an output current to be input to said second gain control signal compensation circuit unit, f is a function.

6 8. The circuit according to claim ⁵7, wherein said first variable gain amplifier comprises multi-stage amplifiers.

10 9. The circuit according to claim 1, which further comprises a gain control signal converter which converts an external gain control signal into an internal gain control signal, said variable gain amplifier including the first field-effect transistor is a first variable gain amplifier, said gain control signal compensation circuit including the second field-effect transistor is a first gain control signal compensation circuit, said gain deviation correction circuit includes a second gain control signal compensation circuit and a second variable gain amplifier, said first gain control signal compensation circuit converts the internal gain control signal into a first gain control signal, said second gain control signal compensation circuit converts the first gain control signal into a second gain control signal, and the first gain control signal is input to said first variable gain amplifier to control a gain of said first

variable gain amplifier, and the second gain control signal is input to said second variable gain amplifier to control a gain of said second variable gain amplifier.

8 ~~10~~. The circuit according to claim ~~8~~⁷, wherein said first variable gain amplifier comprises multi-stage amplifiers.

9 ~~11~~. The circuit according to claim ~~9~~⁷, wherein said second gain control signal compensation circuit comprises a circuit obtained by cascading a voltage/current converter unit connected to an output of said first gain control signal compensation circuit, and a gain control signal compensation circuit unit having a structure equivalent to that of said first gain control signal compensation circuit.

10 ~~10~~ ⁹ ~~12~~. The circuit according to claim ~~11~~⁹, wherein said first variable gain amplifier comprises multi-stage amplifiers.

11 ~~13~~. The circuit according to claim ~~11~~⁹, wherein said voltage/current converter unit converts the first gain control signal Vz1 into a current signal Iz1 according to $Iz1 = f(Vz1)$, where Iz1 is an output current to be input to said second gain control signal compensation circuit unit, f is a function.

12 ~~14~~. The circuit according to claim ~~13~~¹¹, wherein said first variable gain amplifier comprises multi-stage amplifiers.

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15. A variable gain circuit comprising:

a first variable gain amplifier which receives an input signal, outputs an amplified signal, and includes a first field-effect transistor;

5 a second variable gain amplifier which receives the amplified signal, outputs an amplified output signal, and includes a second field-effect transistor;

10 a first gain control signal compensation circuit which outputs a first gain control signal for controlling a gain of said first variable gain amplifier and includes a third field-effect transistor;

15 a second gain control signal compensation circuit which outputs a second gain control signal for controlling a gain of said second variable gain amplifier; and

20 a third gain control signal compensation circuit which receives an externally supplied external gain control signal, converts the external gain control signal into an internal gain control signal, and outputs the internal gain control signal to said first and second gain control signal compensation circuits.

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16. A variable gain circuit comprising:

25 a first variable gain amplifier which receives an input signal, outputs an amplified signal, and includes a first field-effect transistor;

a second variable gain amplifier which receives the amplified signal, outputs an amplified output

signal, and includes a second field-effect transistor;

a first gain control signal compensation circuit which outputs a first gain control signal for controlling a gain of said first variable gain

5 amplifier and includes a third field-effect transistor;

a second gain control signal compensation circuit which receives the first gain control signal and outputs a second gain control signal for controlling a gain of said second variable gain amplifier; and

10 a third gain control signal compensation circuit which receives an externally supplied external gain control signal, converts the external gain control signal into an internal gain control signal, and outputs the internal gain control signal to said first gain control signal compensation circuit.

15 ¹⁵~~17~~. The circuit according to claim ¹⁴~~16~~, wherein said second gain control signal compensation circuit and said second variable gain amplifier compensate a gain deviation caused when the first field-effect transistor of said first variable gain amplifier and

20 the third field-effect transistor of said first gain control signal compensation circuit operate in a strong inversion region.

¹⁴~~16~~. The circuit according to claim ¹⁴~~16~~, wherein

25 said third gain control signal compensation circuit compensates a gain deviation caused when the first field-effect transistor of said first variable gain

~~17~~ 18. The circuit according to claim ¹⁴~~18~~, wherein

15 pair of field-effect transistors, source terminals of
the second pair of field-effect transistors being
commonly connected and grounded through a second
current source including the amplified signal.

20 said first gain control signal compensation circuit
includes a first pair of field-effect transistors, the
internal gain control signal being input between gate
terminals of the first pair of field-effect transistors,
source terminals of the first pair of field-effect
25 transistors being commonly connected and grounded
through a first current source including a given
current, and said second gain control signal

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